

### **Remarks/Arguments**

#### **Double Patenting**

The Examiner has rejected claims 1, 4 and 6-8, on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 9 and 11 of U.S. Patent No. 7,027,001 B2.

Applicant will file a terminal disclaimer under 37 CFR 1.321 to overcome this rejection.

#### **Claim Objections**

The Examiner has objected to claims 1-3 based upon informalities.

Each of claims 1-3 has been modified in accordance with Examiner's suggestion. As such, it is respectfully submitted that the basis for the objection has been eliminated and that the objection should be withdrawn.

#### **35 U.S.C. §112, ¶ 2**

The Examiner has rejected claims 2 and 3 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 has been amended to clarify that the first and second feed-lines terminate in second and third open circuits and that  $\lambda_m$  is the guided wavelength in the feed line.

Claim 3 has been amended to clarify that the microstrip line is terminated by a second short-circuit and that  $\lambda_m$  is the guided wavelength in the feed line.

As such, it is respectfully submitted that the basis for the rejection has been eliminated and that the rejection should be withdrawn.

**35 U.S.C. §103**

Claims 1-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Fujimoto et al. (U.S. Patent No. 5,892,487)(“Fujimoto”).

It is submitted that Fujimoto fails to teach or suggest a planar antenna with the:

“second feed line being coupled in a zone of the slot forming a first short-circuit, so that two complementary radiation patterns are obtained depending on the feed line selected for the access,”

as recited by the amended claim 1.

A problem addressed by the subject application is that the signals transmitted by a transmitter reach a receiver by following a plurality of paths resulting from the many reflections of the signal on the walls, furniture or similar elements. When combined at the level of a receiver, the phase differences between the different rays having taken paths of different lengths gives rise to an interference figure that can cause fading or a significant degradation in the signal. The location of the fading changes over time according to the modifications in the environment such as the presence of new objects or the movement of people. The fading due to multiple paths can lead to significant degradations both at the level of the quality of the signal received and at the level of the system performances.

To solve this problem, the subject application discloses a planar antenna with diversity of radiation realised on a substrate comprising a slot of closed shape dimensioned to operate on a mode higher than a fundamental mode and at least one feed-line coupled to said slot according to a line/slot transition. The perimeter of the slot is selected such that  $p = k\lambda_s$ , where  $p$  is the perimeter of the slot,  $k$  is an integer greater than or equal to 2 and  $\lambda_s$  is the guided wavelength in the slot. The antenna also comprises a first feed-line coupled in a zone of the slot forming first open circuit and a second feed-line placed at a distance  $d = (2n+1) \lambda_s/4$  from said first line, where  $n$  is an integer greater than or equal to zero, said second feed line being coupled in a zone of the slot forming a first short-circuit, so that two complementary radiation patterns are obtained depending on the feed line selected for the access.

Fujimoto fails to teach or suggest a planar antenna with the: “second feed line being coupled in a zone of the slot forming a first short-circuit, so that two complementary radiation patterns are obtained depending on the feed line selected for the access,” as recited by the amended claim 1. Instead, Fujimoto describes a “feeder for a microwave antenna system which can be integrated together with electronic circuitry on a common circuit board. A slot antenna, preferably shaped as an annular slot, is provided on the circuit board, and can be etched on the backside of the circuit board, which is normally a ground plate. The antenna system can be used for reception of DBS signals.” (Fujimoto Abstract)

It is first noted that Fujimoto does not relate to an antenna with diversity of radiation, but instead to an antenna element presenting good polarization diversity (Fujimoto, column 1, lines 57-58). In this case, there is only one radiation diagram and not two possible radiation diagrams depending on the feed line used for the access, as explained in the present application. In Fujimoto, the radiation generated by the annular slot 16 is bidirectional with two maximas. (Fujimoto, column 20, line 60 on) The radiation is perpendicular to the substrate in contrast to the present invention, where the radiation is in the plane of the substrate. (Specification page 4, line 15). Therefore, Fujimoto operates on the fundamental mode and not on a mode higher than the fundamental mode. Furthermore, Fujimoto does not suggest or describe an annular antenna having a diameter  $p = k\lambda_s$ , where  $k$  is greater or equal to 2, so that the antenna operates on a mode higher than the fundamental mode.

Thus, it is respectfully submitted that Fujimoto fails to disclose a planar antenna where the: “second feed line being coupled in a zone of the slot forming a first short-circuit, so that two complementary radiation patterns are obtained depending on the feed line selected for the access,” as recited by the amended claim 1.

In view of the above remarks and amendments to the claims, it is respectfully submitted that there is no 35 USC 112 enabling disclosure provided by Fujimoto that makes the present invention as claimed in currently amended claim 1 unpatentable. It is also respectfully submitted that currently amended independent claim 10 is allowable for at least

the same reasons as claim 1. Since dependent claims 2-9 and 11-14 are dependent from allowable independent claims 1 and 10, it is submitted that they too are allowable for at least the same reasons that their respective independent claims are allowable. Thus, it is further respectfully submitted that this rejection has been satisfied and should be withdrawn.

Having fully addressed the Examiner's rejections it is believed that, in view of the preceding amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's representative at (609) 734-6804, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No fee is believed due. However, if a fee is due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,

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November 3, 2008